In a further additional embodiment, tissue sealing is accomplished by the electrosurgical system described above by continuously monitoring or sensing the tissue impedance rate of change. If the rate of change increases above a predetermined limit, then RF pulsing is automatically terminated by controlling the electrosurgical generator 2 accordingly and any previously changed pulse parameters (e.g., power, voltage and current increments) are reset to the original default values. In this embodiment, the ending tissue impedance, i.e., the tissue impedance at the end of each RF pulse, is also continuously monitored or sensed. The ending tissue impedance is then used to determine the pulse parameters for the subsequent RF pulse; to determine if the seal cycle should end (based on the ending impedance of the last few RF pulses which did not change by more than a predetermined amount); and to determine the duty cycle of the subsequent RF pulse.

Further, in this embodiment, RF power, current and/or voltage levels of subsequent RF pulses can be modified on a pulse-by-pulse basis depending on whether the tissue has responded to the previously applied RF energy or pulse (i.e., if the tissue impedance has begun to rise). For example, if the tissue has not responded to a previously applied RF pulse, the RF power output, current and/or voltage levels are increased for the subsequent RF pulse.

Hence, since these RF pulse parameters can subsequently be modified following the initial RF pulse, the initial set of RF pulse parameters, i.e., a magnitude of a starting RF power level, a magnitude of a starting voltage level, and a magnitude of a starting current level, are selected accordingly such that the first or initial RF pulse does not appreciably heat the tissue. One or more of these starting levels are modified during subsequent RF pulses if the tissue has not responded to the previously applied RF pulse which includes the initial RF pulse.

The above functions are implemented by a seal intensity algorithm represented as a set of programmable instructions configured for being executed by at least one processing unit of a vessel sealing system. The vessel sealing system includes a Precise Seal Intensity control panel for manually adjusting the starting voltage level, in a similar fashion as described above with reference to Figs. 9A and 9B.

As shown in Fig. 15, a preferred Precise Seal Intensity control panel of the present inventive embodiment includes six settings, i.e., "Off" 150A, "VLOW" 150B, "LOW" 150C, "MED" 150D, "HIGH" 150E and "VHIGH" 150F. The Precise Seal Intensity front panel settings 150 adjust the seal parameter values of the Precise Seal Parameter Table as shown by Table I. The selected Precise Seal Parameter Table, adjusted by the Precise Seal Intensity front panel settings 150 is then utilized by an RF generation system, as described above, and an initial RF sealing pulse is then started.

Table I. Precise Seal Intensity Parameter Table.

Setting	Power	Start Voltage
Off	N/A	N/A
Very Low	Reduce by 25%	Reduce by 25%
Low	Reduce by 12.5%	Reduce by 12.5%
Med	No Change	No Change
High	Increase by 12.5%	Increase by 12.5%
Very High	Increase by 25%	Increase by 25%

Fig. 16 is a logic flow diagram that illustrates a method in accordance with the vessel sealing system. At step A', a RF pulse is applied to tissue. At step B', the tissue impedance rate of change is continuously monitored. At step C', a determination is made whether the tissue impedance rate of change has passed a predetermined limit. If yes, at step D', RF pulsing is terminated and any previously changed pulse parameters are reset back to the original defaults. If no, the process proceeds to step E'.

At step E', a determination is made as to whether the RF pulse has ended. If no, the process loops back to step B'. If yes, the process proceeds to step F'. At step F', the ending tissue impedance is measured. At step G', the measured ending tissue impedance is used for determining if the seal cycle should end (based on the ending impedance of the last few RF pulses which did not change by more than a predetermined amount). If yes, the process terminates at step H'. If no, the process continues at step I', where the ending tissue impedance is used for determining the pulse parameters, i.e., the power, current and/or voltage levels, and the duty cycle of the subsequent RF pulse from an entry in one of a plurality of lookup tables.